



handreels were mounted on the skiffs (as was the case with KIR canoes) to minimise lines getting tangled. Rope splicing was also demonstrated during the rigging.

The next part of the on-shore preparations was the demonstration of how hook traces were constructed. This was done in the FA's office building. Boat owners were issued with the same number of hooks, wire trace and swivels to allow them to construct their own traces during the demonstration. These traces would be used by them during the at-sea training trips which are to be purchased at half the price (refer Appendix I). It took about 1 1/2 hrs to complete the gear assemblage demonstration for a total number of eight fishermen.

A schedule for the at-sea training trips was then worked out starting from Thursday 12th September to Thursday 19th September, excluding Saturday and Sunday. It was explained that all boats would be skippered by a member of the team during the at-sea training and that the team would skipper the boats alternately until the team's departure. This means that for the first day's trip two boats would be taken out for training while the third boat remains ashore. On the second day the boat which remained ashore would then be taken out for training together with one of the boats that went out on the first day. Only two boats could be skippered on any one day.

### 3. At-Sea Training

The at-sea training consisted of actual fishing trips during which the deep bottom fishing techniques and method of anchoring and retrieval were demonstrated. Determining the fishing depths using the handreel was also demonstrated during the sea training.

The at-sea training started on Thursday 12th September and ended on Wednesday 18th September instead of Thursday 19th September. The reason is that Nei Tewenei relayed message to us giving it's ETA at Maiana on Thursday 1400hrs and that it would depart the same day for Tarawa. In view of this the last training trips were made on Wednesday 18th September. The schedule is detailed in Table 1.

In total there were 7 trips made during the at-sea training instead of 10 trips. Two trips were cancelled on the 17th September due to bad weather and one trip was not made on Wednesday 18th September as the skiff which was to be taken out for training went to Betio. This skiff belongs to Tenanai.

As usual all trips were made at daytime from early morning (6 Or 7 am) to late afternoon (4 or 5m) on the outer-reef slopes of Maiana. Fishing sites were selected where the wind or current are favourable to enable boats to fish at desired fishing depths.

Baits used vary from day to day which include bonefish, milkfish, trevally, mullet, rainbow runner and some deep bottom fishes. Where possible trolling was carried out on the way to fishing grounds to supplement bait but preferably to catch tuna which are regarded best baits for deep bottom fishing. Of all the baits used the majority were bonefish which were netted in the early morning by a method called 'Te ororo'.

The maximum number of fishermen taken out on each boat was 3. This was to avoid overcrowding and to keep the boats as light as possible to minimise fuel consumptions. The total number of fishermen trained was 13 of which 1 joined the trips four times while 2 joined the trips twice.

#### 4. Results and Catch Analysis

Data from individual fishing trips were recorded on the SPC catch forms and are summarised in Table 1.

A total catch of 688.2kg were landed from 7 trips made during the at-sea training. The catch was composed of both deep and shallow water fishes including sharks by bottom fishing. Although trolling was also carried out whenever possible, only a few were caught namely bluefin trevally (2 pcs of 4.9kg) and rainbow runner (4 pcs of 3.5kg).

The total catch of 688.2kg gives an average catch per trip per boat of 98.3kg, however in terms of deep bottom fishes only the catch rate would be 63kg per trip per boat. These catch rates were obtained utilising two handreels only.

It was estimated that the total number of fishing hours for all trips was 29.75 giving an average time of fishing per trip as 4.25 hrs. This excludes hours spent trolling or steaming to and from fishing grounds.

The fishing effort in terms of reel-hrs was estimated as 59.5 from all seven trips. The average catch per unit of effort (CPUE) is therefore estimated to be 11.6kg/reel/hr. This of course include sharks and some shallow water fishes which were caught on opportunistic basis.

There were 23 species caught while bottom fishing out of which 13 species were deep bottom fishes, 9 were shallow water species and 1 was a grey reef shark (refer Appendix II). As a percentage of the total weight caught by bottom fishing, the catch was made up of six major fish groups viz; Serranidae (32.4%), Lutjanidae (29.3% by L. bohar, a shallow water snapper and 17.2% by deep water snappers), Carrangidae (9.3%) Lethrinidae (8.6%), Carchahinidae (2.2%) and Sphyraenidae (1%). The deep water snappers, Etelis were not caught during any of the training trips.

Two types of Yamaha outboard engines were used, one was a 15hp on the KIR model canoe and the others were a 40hp on the two skiffs. The total fuel consumption was 61.5 litres for the 15hp

motor giving an average fuel consumption of 15.4 litres per trip, and 72 litres for the 40hp motor having an average fuel consumption of 24 litres per trip. It is interesting to note from these figures that the catch return per litre of fuel burnt by both engines was 7.1kg for a 15hp engine and 3kg for a 40hp engine.


#### 5. Comments

The execution of the project on the island was successful as with other islands visited. The on-shore preparations which consisted of the rigging of boats and assemblage of hook traces took one complete day enabling the at-sea training to be carried out during the rest of the days excluding Saturday and Sunday. Rough weather was experienced during one of the week days which forced the team to cancel fishing trips for that day.

In May, 1980 SPC Masterfisherman P. Taumaia visited the island and conducted for the first time (in collaboration with Fisheries Division) deep bottom fishing activities. His average catch rate was reported to be 10.5kg/reel-hr. In comparison with the 11.6kg/reel-hr obtained from our visit (CPUEs are for all species including sharks), it may well support the assumption that the stocks of deep bottom fishes along the deep reef slopes of Maiana have to date remained untapped as confirmed by the increase in CPUE of 1.1kg/reel-hr over the 1980 figure. This increase further establishes the assumption that the biomass of the virgin stock of this resource may have slightly increased by a certain proportion since 1980.

From fuel consumption figures and catch rate analysis, the KIR model canoe powered by a 15hp Yamaha outboard proved to be more economical during fishing operations as compared to the two skiffs which were powered by a 40hp Yamaha outboard. The 15hp outboard consumes far less fuel enabling fishermen to pay off fuel costs more easily than those with the 40hp outboards.

During the visit a fisherman owning a local outrigger canoe asked if he could be supplied with deep bottom fishing gear, and requested if handreels could also be mounted on his outrigger canoe. The team has considered his request and he will be provided with the handreels, anchor, etc. The team has also advised the fisherman and island Fisheries Assistant on the best possible way of mounting the reels on the canoe. His requirements are being prepared and will be despatched to the island Fisheries Assistant when they are ready. The island Fisheries Assistant has also been asked to assist the fisherman mounting his gear.



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27/9/91

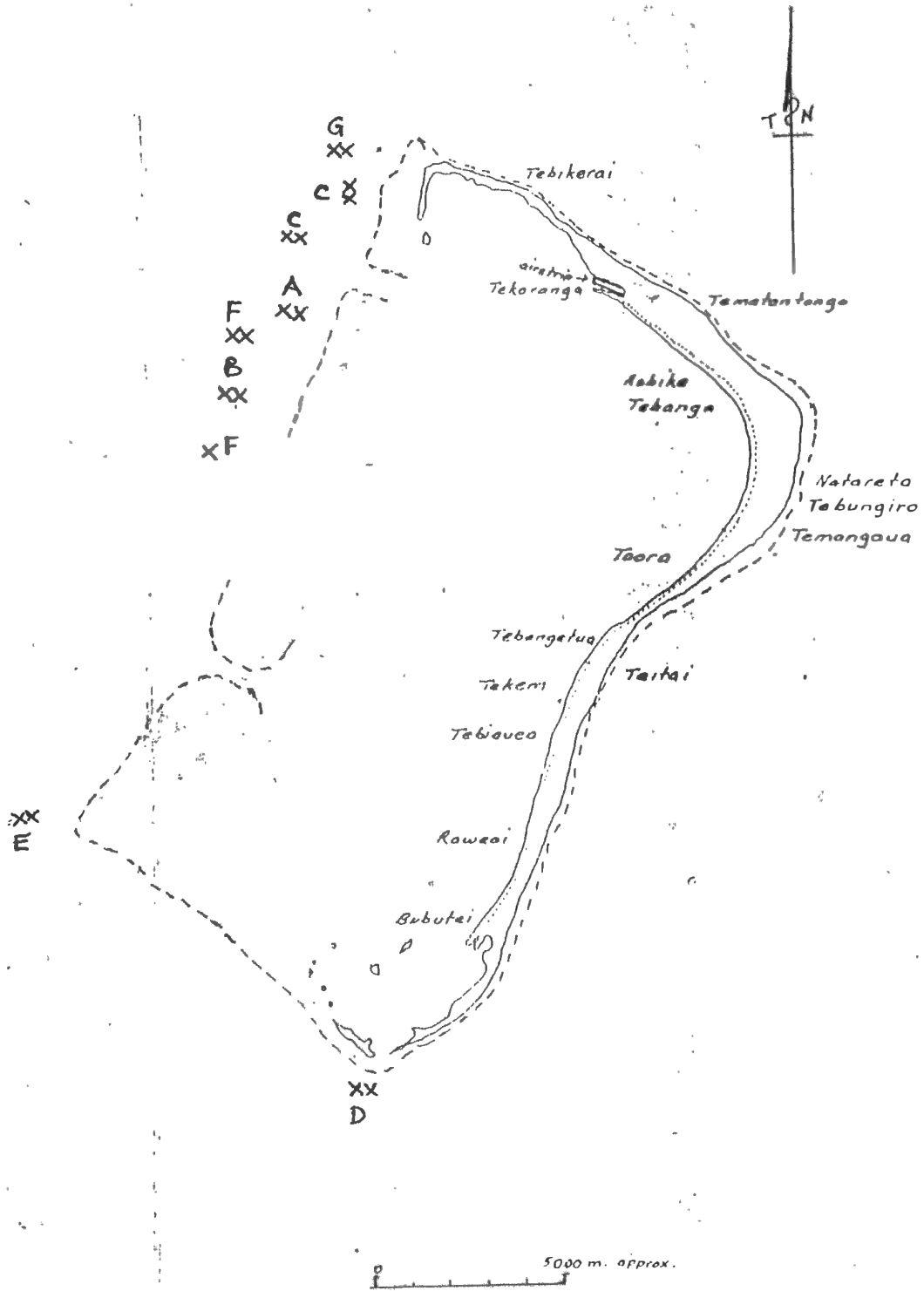
Table 1: At-sea training schedule and data from individual fishing trips.

Date	Fishing Area (refer map)	Boat & Skipper	Catch (kg)	Est.Fishing hrs	No.of reels	Est. Effort
12/9/91	A	A(R)	46	4.5	2	9
12/9/91	B	B(K)	143.4	3.5	2	7
13/9/91	C	B(R)	114.7	5	2	10
13/9/91	D	C(K)	126.6	3	2	6
16/9/91	E	B(R)	133.3	5.5	2	11
16/9/91	F	A(K)	79.3	4.75	2	9.2
17/9/91	Rough	Weather	-	No	Fishing	
18/9/91	G	B(K)	44.9	3.5	2	7
7 trips			688.2kg	29 3/4hrs		59.5
						reel/hrs

KEY:

- Boats:
  - A - Skiff owned by Mr. Tonana
  - B - KIR **odel** canoe owned by KPC, Aobike
  - C - Skiff owned by Mr. Tenanai
- Skippers:
  - K - Kamori
  - R - Rimeta

# MAIANA ISLAND



Appendix I: List of fishing gear issued to each participating boat at Maiana. Gears are to be purchased at 50% reduced price.

<u>Item</u>	<u>Price</u>
1. Horizontal stand, 2pc @ \$21.95	43.90
2. Handreel, 2pc @ \$16.66	33.32
3. Anchor, 1pc	13.34
4. Buoy clip, 1pc	3.75
5. Anchor rope, 2 coils @ \$33.00	66.00
6. Trace wire, 30m @ \$0.15	4.50
7. Monoline, 500 reel-turns @ \$11.92/turn	23.84
8. Pigtail swivels, 4pc @ \$1.04	4.16
9. Hooks, 36pc @ \$0.50	18.00
10. Galv. washers 5/8", 4pc @ \$0.10	0.40
11. Brass washers 5/8", 4pc @ \$0.32	1.28
12. Anchor buoy, 1pc	<u>24.00</u>
13. Shackle 1pc	<u>\$238.15</u>
50% reduce price	<u>\$119.08</u>

Note: An extra charge of \$11.00 has been added to KPC, Aobike KIR canoe which was issued with two new outboard sparks by the team. The charge is for the full cost of the new sparks issued.

Appendix II: Catch composition by bottom fishing listed in order of importance by weight.

<u>Fish Group</u>	<u>No.</u>	<u>%No.</u>	<u>Wt.</u>	<u>%Wt</u>	<u>Av.Wt</u>
<u>1. Lutjanidae</u>					
a. Shallow water snapper <u>Lutjanus bohar</u>	66	25.6	201.3	29.3	3.1
b. Deep water snappers					
<u>Aprion viresceus</u>	6	2.3	25.8	3.7	4.3
<u>Aphareus rutilans</u>	1	0.4	5.1	0.7	5.1
<u>Pristipomoides auricilla</u>	2	0.8	3.3	0.5	1.7
<u>Pristipomoides falvipinnis</u>	29	11.2	58.9	8.6	2.0
<u>Paracaesio stonei</u>	1	0.4	1.1	0.2	1.1
<u>Pristipomoides zonatus</u>	20	7.8	24	3.5	1.2
<u>2. Lethrinidae</u>					
<u>Watisia mossambica</u>	18	7.0	47.1	6.8	2.6
<u>Lethrinus elongatus</u>	7	2.7	12.1	1.8	1.7
<u>3. Serranidae</u>					
<u>Epinephalus chlorostigma</u>	48	18.6	45.2	6.6	0.9
<u>Epinephelus morrhua</u>	13	5.0	56.1	8.2	4.3
<u>Epinehelus maculatus</u>	1	0.4	0.5	0.1	0.5
<u>Epinephelus leprosus</u>	1	0.4	40	5.8	40.0
<u>Epinephelus miliaris</u>	7	2.7	5.8	0.8	0.8
<u>Epinephelus sp</u>	5	1.9	8.3	1.2	1.7
<u>Epinephelus septempfasciatus</u>	1	0.4	60	8.7	60.0
<u>Cephalopholus sonnerati</u>	1	0.4	0.5	0.1	0.5
<u>Parupeneus pleurospilos</u>	1	0.4	0.8	0.1	0.8
<u>Variola louti</u>	10	3.9	5.9	0.8	0.6
<u>4. Carrangidae</u>					
<u>Caranx lugubris</u>	16	6.2	58.4	8.5	3.7
<u>Caranx melaumpygus</u>	2	0.8	5.8	0.8	2.9
<u>5. Carchahinidae</u>					
<u>Carchahinidae amblyrhyncos</u>	1	0.4	15	2.2	15
<u>6. Shyraenidae</u>					
Barracuda	1	0.4	6.7	1.0	6.7
			<u>258pcs</u>	<u>688.2kg</u>	